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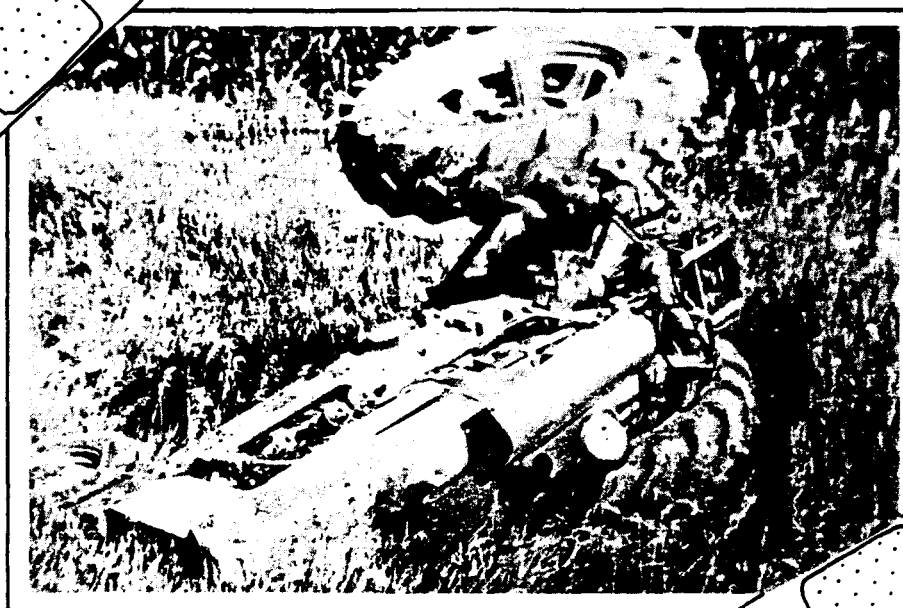
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Farm Accidents in North Dakota

ROBERT FANNING
Extension Farm Safety Specialist, NDSU

**COOPERATIVE
EXTENSION
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North Dakota State University Fargo, North Dakota 58105



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From 1946 to 1980, farming was rated as the third most hazardous occupation in the U.S. behind mining and construction. These figures are arrived at by the National Safety Council, which tabulates deaths per 100,000 workers in each occupation. Agriculture's accident record has not gotten worse, but the accident records of mining and construction have improved. Statistics for 1980 indicate that agriculture is now the most hazardous of all occupations.

To organize and carry out effective safety programs, it is essential to know more about accidents. This includes an understanding of the accident picture statewide and nationwide. Facts such as accidents by age group, family member, major activity on the farm, part of the body injured, time of day, and what caused the accidents are important. These facts help to identify typical accident-prone situations and what to do to avoid them. These facts also aid in safer machine and building designs. Similar to soil testing or livestock performance testing, the identification of related facts helps to gain control of the outcome.

About six sources of varied, limited accident and fatality information are available. (1) The Vital Statistics Division of the State Health Department records coded and confidential information from death certificates. Selected information about the farm-related deaths is forwarded to the Extension Safety Specialist at NDSU. (2) A statewide newspaper clipping service is maintained to compile information on accidents (mostly fatalities) that get reported in any North Dakota newspapers. (3) The State Fire Marshall's Office and several fire departments are randomly contacted in regard to fires that occur in agricultural settings. (4) The four Poison Control Centers in North Dakota can be contacted regarding chemical incidents such as agricultural pesticides, anhydrous ammonia, silo gas, manure gas and carbon monoxide. Other sources include (5) individual reports from Extension workers and the public and (6) reports from the National Safety Council. These sources of information are used to give direction to safety programs, indicate what areas to concentrate on and to accumulate statistics.

A void in the information remains, however. The only reliable statistics available include either accidents severe enough to be reported in the newspaper or deaths. This information competes with other events of the day, available space and editor interest. A standardized Farm Accident Survey was organized nationally by the National Safety Council and the United States Department of Agriculture in 1968 to collect information about accidents (not just fatalities) on a more generalized basis. A survey is conducted in each state with the data then sent to the National Safety Council for a national report. Within about five years, a follow-up survey is needed to determine changes in the farm accident situation. Many states have conducted one survey and several have now conducted a second survey five years

later. The North Dakota Cooperative Extension Service is cooperating in this national effort.

For the North Dakota Farm Accident Survey, 14 counties were randomly selected in 1979 to represent a cross-section of the farming activity of the entire state (Fig. 1). The counties included are: Grand Forks, Steele, Ramsey, Bottineau, Renville, McHenry, Mountrail, McKenzie, Hettinger, Adams, Kidder, Emmons, Logan and Barnes. In each of these 14 counties, volunteer interviewers contacted randomly selected farms and gathered information related to accidents on these farms during one year. All accidents, ranging from those that caused personal injury requiring medical attention and/or 1/2 day or more lost from work or usual activity to those that were **serious** or **fatal**, were included. Accidents labeled as **serious** included broken bones, a cut requiring treatment or a strained back. Standard forms were provided for the interviewers to report the accidents. The interviewers reported who the accident happened to, how old they were, what caused the accident, what month the accident happened and other questions about the accident.

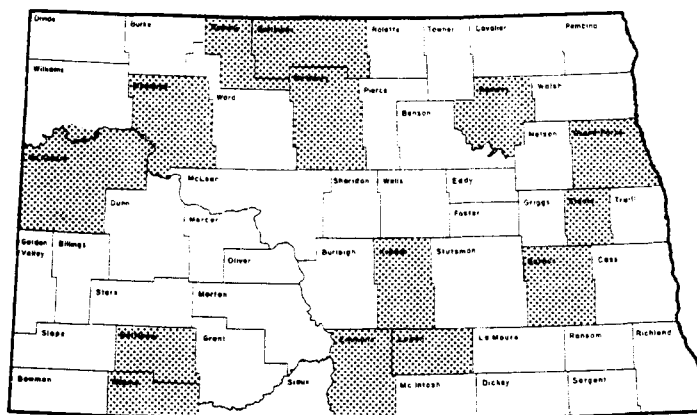


Fig. 1. 14 N.D. counties were selected to participate in the Farm Accident Survey.

In the 12-month period October 1, 1979, to September 30, 1980, volunteer interviewers kept records on 443 farms. Briefly from that information, it was found that:

- One out of every 7.5 farms had an accident requiring medical attention or causing the loss of 1/2 day or more from work or usual activity.
- 71.1 percent of the accidents involved the husband of the farm family and 96.6 percent of the accidents involved a family member.
- The age group 25-44 suffered the most accidents at 40.7 percent of the total.
- March, April, July and October were the most common months for accidents with 33 of the 59 accidents.

- 56 percent of the accidents were classified as serious, which includes a broken bone, a cut requiring treatment or a strained back.
- The leg, foot, ankle, finger and back were the most common parts of the body injured.
- 34 percent of the accidents occurred in the barnyard or farmyard.
- 49 percent of the accidents occurred during machinery maintenance or routine chores.
- The average accident cost \$486.88 in hospital and doctor bills and cost 8.8 days lost from usual activity.
- Two fatalities were reported.

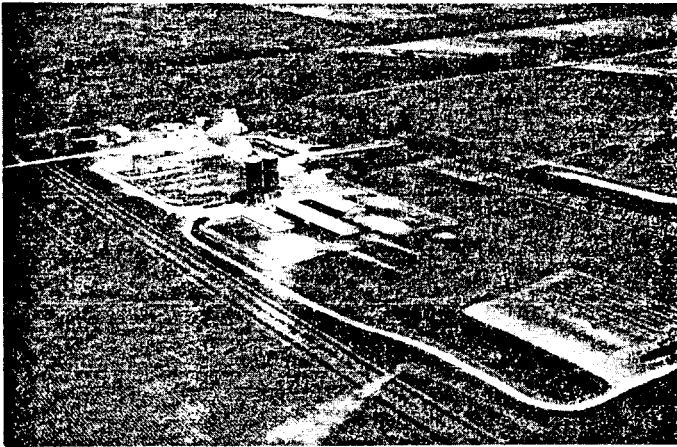


Fig. 2. All farms have the potential for accidents, regardless of size or diversity.

Results:

The North Dakota farm accident survey conducted during October, 1979, to September, 1980, showed 59 accidents occurring on 443 farms or one accident for every 7.5 farms. If these figures were projected over North Dakota's 39,000 farms, the survey would indicate a potential for approximately 5,200 accidents occurring per year that require medical attention and/or cause the loss of 1/2 day or more from work or usual activity.

This information is helpful to identify specific information about accidents on farms. Extension education activities are now being prepared to zero in on how to reduce these kinds of accidents. For example, a plan has been distributed for making a portable grain auger dolly. (Fig. 3)

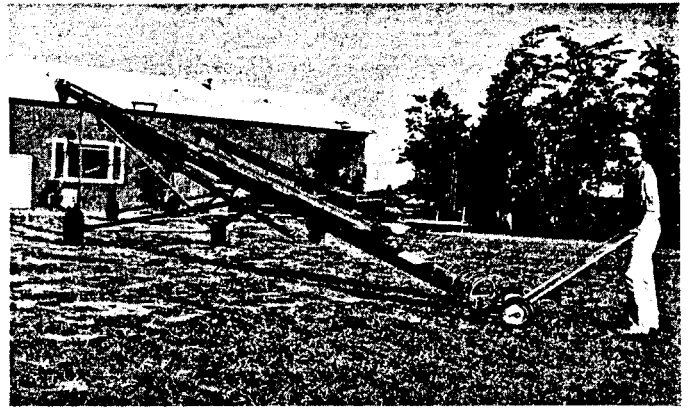
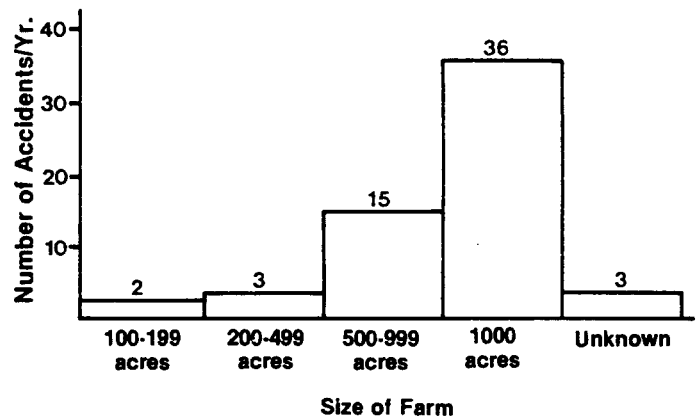


Fig. 3. Plans for building a grain auger dolly are available to reduce back injuries and overhead powerline electrocutions by moving augers.

Over half of the accidents occurred on farms of over 1,000 acres. This is to be expected with the large farms found in North Dakota.

ACCIDENTS BY SIZE OF FARM (N.D. Farm Accident 1979-1980 Survey)



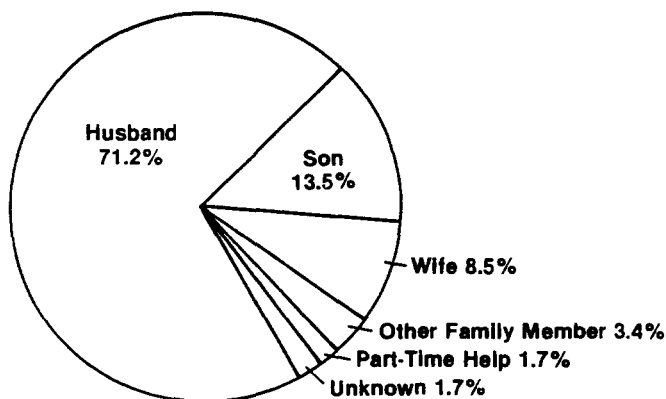
ACCIDENTS BY TYPE OF FARM (North Dakota 1979-1980)

Major Source of Income	No. of Accidents	Percent of Total
Unknown	3	5.1
Wheat	20	33.9
Other Grain Crop	14	23.7
Other Field Crop	1	1.7
Beef Cattle	11	18.6
Sheep and Goats	1	1.7
General Livestock	5	8.5
Dairy Farms	4	6.8
Total	59	100.0

Accidents by type of farm is difficult to determine because many farms produce several crops plus livestock. The majority of accidents were found in grain

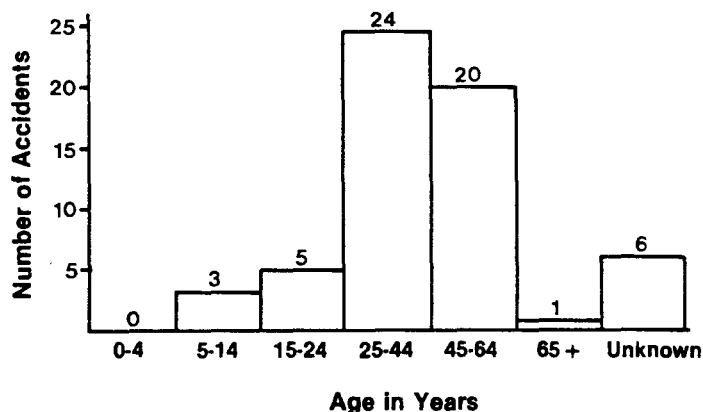
and beef cattle operations, many of which produce both commodities.

ACCIDENTS BY FAMILY MEMBER
(North Dakota 1979-1980 Farm Accident Survey)



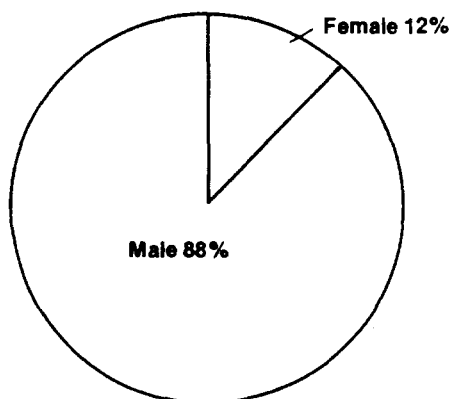
This graph illustrates the strong tendency in North Dakota of farms to be family operated.

AGE OF ACCIDENT VICTIM
(North Dakota 1979-1980)



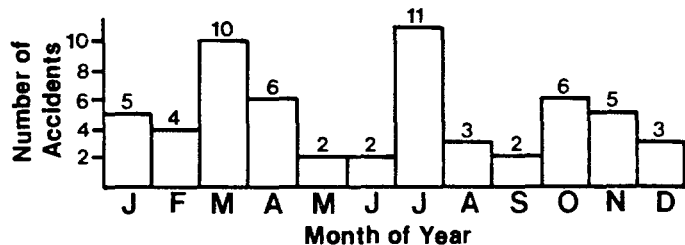
The results of the information on an accident victim by age indicates that young people need safety instruction and the ages 25 to 44 need awareness and motivation of farm hazards.

SEX OF ACCIDENT VICTIM
(North Dakota 1979-1980)



The distribution of accident victims by sex is 88% male and 12% female.

MONTH OF ACCIDENT
(North Dakota 1979-1980)



The peak months for accident occurrence seem to be March, April, July and October. The increased activity during these months would indicate that the busy season definitely contributes to accident potential.

TYPE OF INJURY
(North Dakota 1979-1980)

	No. of Accident	Percent of Total	27 State Report (%)*
Amputation	2	3.4	1.5
Asphyxiation	0	0.0	0.1
Bruise	6	10.2	12.4
Burn	0	0.0	2.3
Cut or Laceration	6	10.2	23.0
Crushing	4	6.8	0.0
Eye Injury	4	6.8	5.5
Fracture	9	15.2	16.1
Mangled	1	1.7	1.4
Punctured	2	3.4	5.8
Sprained or Stra	18	30.5	15.4
Other	7	11.8	16.5
Total	59	100.0	100.0

*The 27 state report consists of this type of information from 27 states combined into one report. This report gives more of a national picture of the farm accident survey.

The type of injury with farm accidents varies greatly.

SERIOUSNESS OF INJURY
(North Dakota 1979-1980)

	No. of Accidents	Percent of Total	27 State Report (%)
Slight	21	35.6	31.0
Severe	33	56.0	66.2
Permanent	3	5.0	1.9
Fatal	2	3.4	.9
Total	59	100.00	100.00

Farm accidents are quite often severe and result in considerable cost and personal injury.

PART OF BODY INJURED
(North Dakota 1979-1980)

	No. of Accidents	Percent of total	27 State Report (%)
Arm	3	5.1	7.7
Back	7	11.9	10.0
Chest	3	5.1	3.3
Eye	4	6.8	6.2
Finger	6	10.1	12.6
Foot and/or Ankle	9	15.2	11.2
Genital	0	0.0	0.1
Hand and/or Wrist	3	5.1	9.1
Head, Except Eye	2	3.4	7.0
Leg	12	20.3	13.0
Neck	2	3.4	1.1
Shoulder	2	3.4	2.6
Toe	1	1.7	1.5
Trunk	3	5.1	1.0
Other	2	3.4	13.6
Total	59	100.0	100.0

Nearly every part of the body has the potential to be injured in a farm accident.

LOCATION OF ACCIDENT
(North Dakota 1979-1980)

	No. of Accidents	Percent of Total	27 State Report (%)
Barn	4	6.8	15.0
Barnyard	20	33.9	18.3
Driveway	2	3.4	5.1
Farm Building	10	16.9	13.0
Field or Cropland	5	8.5	20.1
Road, County or Township	1	1.7	3.1
Land, Pasture Range or Woods	2	3.4	7.8
Public Place	1	1.7	1.0
Other Location	14	23.7	16.6
Total	59	100.0	100.0

A large percentage of the accidents occurred in places where the farm worker spends a good deal of his/her time such as the barnyard or a farm building (Fig. 4).

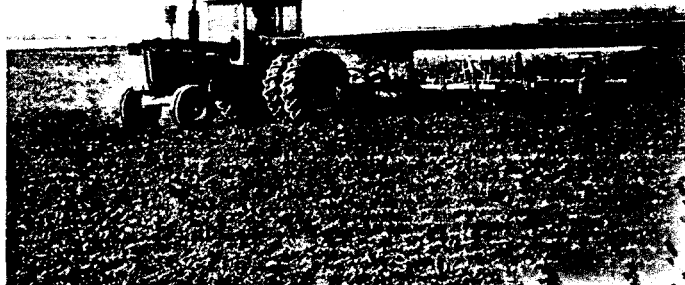


Fig. 4. Few accidents were reported happening in the field.

TYPE OF WORK BEING PERFORMED
(North Dakota 1979-1980)

	No. of Accidents	Percent of Total	27 State Report (%)
Unknown	1	1.7	1.2
Farm Building Maintenance	2	3.4	7.0
Field Work	4	6.8	21.2
Machine Maintenance	15	25.4	12.8
Routine Chores	14	23.7	26.2
Livestock Treatment	10	16.9	8.0
Operating/Riding Machine	5	8.5	2.0
Other Activity	8	13.6	21.6
Total	59	100.0	100.0

A large percentage of the accidents also occurred while the farm worker is doing a task which many farm workers are familiar with (Fig. 5).

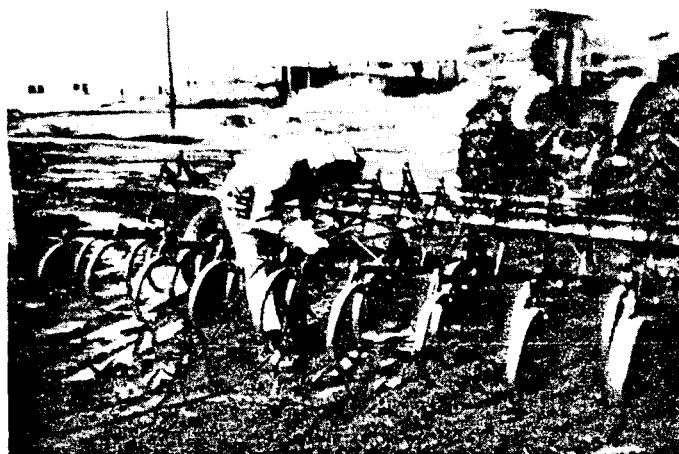


Fig. 5. A large percentage of accidents occurred during machinery maintenance.

BODILY MOTION OF VICTIM
(North Dakota 1979-1980)

	No. of Accidents	Percent of total	27 State Report (%)
Climbing	6	10.2	7.0
Jumping	1	1.7	3.0
Kneeling	2	3.4	4.0
Lifting	5	8.5	12.1
Lying Down	0	0.0	0.7
Reaching Stretch	8	13.5	0.0
Running	0	0.0	2.9
Sitting	5	8.5	1.4
Standing	15	25.4	35.0
Walking	9	15.3	15.2
Other	8	13.5	18.7
Total	59	100.0	100.0

The bodily motion of the worker may make him/her more or less susceptible to an accident.

HOW THE INJURY OCCURRED
(North Dakota 1979-1980)

	No. of Accidents	Percent of Total	27 State Report (%)
Caught Part of Body Struck by or Against Object	10	17.0	21.2
Struck by Falling Object	16	27.1	16.7
Struck by Flying Object	2	3.4	4.9
Contact with Sharp Object	2	3.4	4.1
Foreign Object Struck or Lodged in Body	3	5.1	10.4
Fall on Same Level	1	1.7	3.7
Fall from One Level to Another	4	6.9	9.0
Overexertion	5	8.4	12.2
Other	7	11.8	3.6
Unknown	7	11.8	14.2
	2	3.4	0.0
Total	59	100.0	100.0

The various ways in which the injuries occurred are explained here.

AGENCY OF ACCIDENT
(North Dakota 1979-1980)

	No. of Accidents	Percent of Total	27 State Report (%)
Ag. Machinery	13	22.0	17.2
Animal	9	15.2	17.4
Another Person	1	1.7	0.8
Chemical	0	0.0	1.0
Electricity	0	0.0	0.7
Firearms	0	0.0	0.1
Gas/Vapor	0	0.0	0.4
Hand Tools	0	0.0	8.4
Power Tools	3	5.1	4.7
Ladder	1	1.7	2.3
Tractor	6	10.2	8.8
Truck	3	5.1	3.7
Other Vehicle	1	1.7	13.3
Floor or Ground	5	8.5	0.0
Walls, Doors, Fences or Gates	1	1.7	0.0
None	2	3.4	20.0
Unknown	5	8.5	0.0
Other	9	15.2	1.0
Total	59	100.0	100.0

Causes of the accidents varied, but agricultural machinery, animals and tractors were the cause of the majority of the injuries.

When a vehicle was involved, the victim was the driver or operator in 19 of the accidents, a passenger or assistant in three of the accidents and a nonoccupant or a bystander in three of the accidents. In 34 of

the accidents, the status of the victim in relation to the vehicle was unknown or not applicable.

Costs

The average accident cost:

—\$486.88 in hospital and medical bills
(the maximum bill was \$3,400)

—\$128.77 in replacement labor

and resulted in an average of:

—8.8 days lost from usual activity

—2.25 days in the hospital

—2.5 days of hired help to replace victim

These figures may be slightly high because medical and time lost figures were not reported for all accidents. In 92.3 percent of the accidents, the health status of the victim was good; in 5.8 percent of the cases, he/she was under a doctor's care and in 1.9 percent of the cases he/she was taking medication.

Farm machinery was involved in the injury in 11 of the 59 accidents reported.

SCENE OF ACCIDENT (Farm Machinery)
(N.D. Farm Accident Survey 1979-1980)

	No. of Accidents	Percent of Total
Barn	1	9.0
Grain Field	3	27.1
Granary or Feed Storage	3	27.1
Shop	1	9.0
Other	3	27.8
Total	11	100.0

Accidents with farm machinery occurs in various locations on the farm.

ACT PERMITTING THE INJURY
(N.D. Farm Accident Survey 1979-1980)

	No. of Accidents	Percent of Total
Improper Use of Equipment	1	9.1
Inattentive	1	9.1
Lost Balance	1	9.1
Reaching	5	45.4
Unsafe Position Posture	2	18.2
Other	1	9.1
Total	11	100.0

Many of the accidents with farm machinery occurs when an unsafe act is performed.

PART OF MACHINE CAUSING INJURY
(N.D. Farm Accident Survey 1979-1980)

	No. of Accidents	Percent of Total
Auger	2	18.2
Control Devices	1	9.1
Hitch or Drawbar	1	9.1
V-Belt & Pulley	2	18.2
Other	5	45.4
Total	11	100.0

When farm machinery is involved in an accident, this chart shows the machine parts which caused the injuries.

Conclusions

North Dakota is one of the most agricultural states in the country. In 1978 and 1979, the Greater North Dakota Association reported that agriculture produced approximately $\frac{2}{3}$ of the state's income. Information from the Department of Vital Statistics, North Dakota State Department of Health, indicates that of 650 work related fatalities from 1960-1978, 354 of them were categorized under agriculture. Some of these fatalities may have not occurred on the farm, but are related to agriculture.

Activities like the farm accident survey are needed to identify accident problem areas, direct safety programs, and help reduce accidents. In turn this will reduce hardship, suffering, pain and costs to everyone. Farm accident surveys are intended to be repeated at five-year intervals. These future surveys will help measure changes in accident trends and identify areas to concentrate efforts in safety programs. This survey has shown that accidents are costly and has identified areas that people who are concerned with farm safety need to concentrate on. These are:

- To upgrade and strengthen the Tractor Certification Program (Fig. 6). This will get safety information to 14-15 year olds which will stay with the participants as they grow older and start their own farming operations.

- To reach the age group 25-64 with safety information.

- To put out more safety information in the critical accident months — March, April, July and October.

- To stress the use of personal protective equipment.

- To reduce the odds of accidents during machinery maintenance and routine chores.

- To put more emphasis on proper lifting techniques.

- To educate family members, particularly the husband of the farm family in accident prevention.

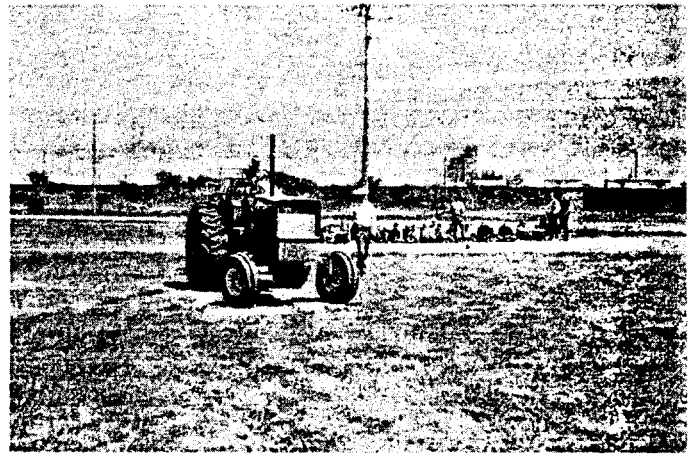


Fig. 6. The tractor certification program for 14 and 15 year olds is one of the successful methods of educating farm workers.

Thanks to the County Agents, Home Economists, Associate County Agents and Assistant County Agents of the participating counties for their help in organizing this survey, recruiting volunteer interviewers and holding training meetings for the volunteers.

A special thanks to Mrs. Karen Herman, State Safety Chairman of the North Dakota Extension Homemakers (June, 1978 to June, 1981) and the Homemakers County Safety Chairman and volunteer interviewers in each of the 14 participating counties.

Grand Forks — Morris Davidson, County Agent
Dale Edwards,
Associate County Agent
Helen Dahl, Home Economist
Mrs. Darel Fossum,
Homemakers County Safety
Chairman

Steele — Gerald LeClerc, County Agent
Mrs. Edith Lundstrom,
Homemakers County Safety
Chairman

Ramsey — Tom Olson, County Agent
Dave Ramsey,
Associate County Agent
Maxine Frank, Home Economist
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